

**SECTION 15120****GATE VALVES****PART 1 - GENERAL****1.01 SCOPE OF WORK**

- A. The Contractor shall furnish and install gate valves complete and operable, including all appurtenances and accessories.
- B. The MD-WASD will permit the use of resilient seated type gate valves in potable water systems, as described herein. Such use shall be restricted to potable water systems of nominal sizes 4-inch through 36-inch. All other size or system applications shall be allowed only if reviewed and approved by the MD-WASD. Resilient seat gate valves shall only be used in sewer applications where cover depth is sufficient to mount the valve in the vertical position and only with review and approval of the MD-WASD. Sewer lines may not dipped or lowered in close proximity to a gate valve for the purpose of providing said cover. Resilient seat gate valves used as tapping valves in sanitary sewer systems and laid upon their side shall be left open when the line is placed in operation and backed up with a plug valve to provide flow control.

**1.02 RELATED WORK SPECIFIED ELSEWHERE**

Section 15100 - Valves, General

**PART 2 - PRODUCTS****2.01 GATE VALVES, GENERAL**

- A. As used herein, "ANSI" denotes the American National Standards Institute; "AWWA" denotes the American Water Works Association; and "ASTM" denotes the American Society for Testing and Materials.
- B. All valves specified herein, whether manufactured under the provisions of AWWA C500-93 "Metal-Seated Gate Valves for Water Supply Service"; C509-94 "Resilient-Seated Gate Valves for Water Supply Service" or C515-01 "Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Service" shall be furnished with an Affidavit of Compliance from the manufacturer as required by Section 6.3 of AWWA C515-01. **This Affidavit of Compliance shall state that the valve and all materials used in its construction conform to the applicable requirements of the standard under which the valve is manufactured and the MD-WASD's specifications and that all tests specified in the applicable standard have been performed and all test requirements met.** The affidavit shall accompany the invoice or in donations situations shall be furnished prior to installation of the valves. Payment will not be made nor installation allowed until after receipt of the affidavit.

- C. The MD-WASD requires that suppliers shall submit with their proposals, if bidding on valve sales to the MD-WASD; or shop drawings, if supplying valves to the MD-WASD for contract or donations work; all data as listed in the "Data to Be Supplied by the Manufacturer" Sections of the referenced standards. This material is Section 1.3 in C500-93, 4.1 in C509-01 and 4.1 in C515-01 and is identical. Data to be furnished is as follows:

*Catalogue Data.* The manufacturer shall supply catalogue data, including illustrations and a parts list that identifies the materials used for various parts. The information shall be in sufficient detail to serve as a guide in the assembly and disassembly of the valve and for ordering repair parts.

*Weight information.* The manufacturer shall provide a statement of the net assembled weight for each size of valve exclusive of joint accessories.

*Assembly Drawings.* The manufacturer or supplier shall submit to the purchaser one set of drawings showing the principal dimensions, construction details, and materials used for all parts of the valve. All work shall be done and all valves shall be provided in accordance with these drawings after the drawings have been reviewed and accepted by the purchaser."

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In the quotation above, the word "purchaser" shall be construed to mean the Miami-Dade Water and Sewer Department in either direct purchase or contract/donations situations.

- D. All work performed according to the three standards cited above, except prototype testing, shall be subject to inspection and acceptance by the MD-WASD or its representatives who shall have access to all places of manufacture where these valves are being produced and tested. Suppliers shall, with their shop drawing submittals, submit the company name and location of the actual manufacturer of the valve which shall include Country, City, and street address of the manufacturer. Where valves are not domestically produced and tested, the MD-WASD reserves the right to require that the Affidavit of Compliance be signed and sealed by a Professional Engineer, licensed to practice in the state of where the importing firm is located or the State of Florida. When this is required, the MD-WASD's decision as to its necessity shall be final and no extra compensation will be allowed.
- E. All valves shall conform with ANSI/NSF Standard 61, "Drinking Water System Components-Health Effects".
- F. Grades B and C bronze as listed in Table 1 of AWWA C500-93 shall not be used in the fabrication of any of the various valve types listed in this specification. Aluminum bronzes, if used, shall not dealuminize and the method of preventing this shall be fully described in the submittal.
- G. AWWA Standard C515-01 lists a number of copper alloys for valve stems and gates. Of these the MD-WASD will accept alloys with the following Unified Numbering Series (UNS) numbers; C66100, C87600, C99400 and C99500. This same standard lists other copper alloys for Stem Nuts and Gates. Of these the MD-WASD will accept alloys with the following UNS numbers; C83600, C83450, C95200, C95500, C95800 C99400 and C99500.
- H. Other copper alloys not listed in the standard may be used but must meet the performance requirements of the Standard, including but not limited to, minimum yield strength, chemical requirements and corrosion. The MD-WASD requires that alloys containing more than sixteen (16) percent zinc shall not be used.

## 2.01 METAL-SEATED GATE VALVES

- A. Metal-seated gate valves 3-inch and larger shall be manufactured in accordance with the applicable provisions of ANSI/AWWA Standard C500, "Metal-Seated Gate Valves for Water Supply Service", as modified herein. The valves are to be installed under buried and/or submerged conditions.
- B. All metal-seated gate valves shall be bronze-mounted, and shall have a cast iron body, parallel or inclined seats, double discs and a non-rising stem. Stem shall be bronze. Valve body and bonnet gaskets shall be rubber or rubber composition, inorganic mineral fiber and paper are not acceptable. Rubber and rubber composition materials shall be suitable for use in water containing chlorine or chloramines and in sanitary sewage. All valves 20-inch and larger shall be equipped with gearing conforming with their particular AWWA standard. Bevel or spur gearing shall be supplied as ordered with no cost differential. Disk spreading devices shall be Monel, AISA Type 316 stainless steel or bronze. Valves shall open by rotating the valve stem counterclockwise, and shall have an AWWA 2-inch square operating nut with skirt.
- C. "O"-ring stem seals shall be neoprene, Buna-N, Nitrile or approved equal. No natural rubber compounds will be acceptable. The stem seals shall be of design that permits the replacement of the "O"-ring seals while the valve is in service, without undue leakage.
- D. All external ferrous items, except cast iron, shall be hot-dipped galvanized in accordance with the most current ANSI/ASTM Standard A123, "Zinc (Hot-Galvanized) Coatings on Iron and Steel Products", or ANSI/ASTM Standard A153, "Zinc Coating (Hot-Dip) on Iron and Steel Hardware", or Type 304stainless steel.
- E. Flanged valves shall have ends faced and drilled conforming to ANSI Standard B16.1, Class 125. Bolt holes in the flanges shall be equally spaced and shall straddle the vertical and horizontal centerlines. Joint materials for flanged valves will be furnished with the valve.
- F. Mechanical joint valves shall have ends complying with ANSI/AWWA Standard C111/A21.11, "Rubber-Gasket Joints for Ductile Iron Pressure Pipe and Fittings". Mechanical joint gaskets, glands, tee-head bolts and hex nuts shall be included with the valve. Segmented glands or follower glands held in place by set screws will not be acceptable. Bolt holes in flanges of the mechanical joint shall be equally spaced and shall straddle the vertical centerline. Gaskets shall be shipped separately in suitable protective containers. Metal-seated valves for use in sewerage shall have neoprene gaskets.
- G. Metal-Seated Gate valves 20-inch and larger shall have bypass gate valves sized in accordance with Table 8 of ANSI/AWWA Standard C500. The bypass valves shall conform to the applicable requirements for the gate valves specified herein, and also with the requirements listed below.
  1. The bypass valves shall be one of the following types:
    - (a) The valve shall have ANSI Standard B16.1, Class 125, end flanges for connecting to adapter fittings which in turn connect to bosses on the main valve. Joint materials shall be ANSI sized and approved, 1/8-inch thick full-faced rubber gaskets and hot-dip galvanized steel bolts and nuts.
    - (b) The valve shall be integral with the bypass unit which connects directly to bosses on the

main valve without the use of adapter fittings. Joint materials and the shape of the gasket may be the manufacturers standard, except that the gasket shall be at least 1/8-inch thick, full-faced and the bolts and nuts shall be hot-dip galvanized steel.

2. The bypass valve shall be completely mounted to the gate valves specified herein by the manufacturer.

H. Torque limiting device: See Section 15100, "Valves, General"

- I. Testing: All production tests on shall be performed on all valves supplied without exception. Operation and hydrostatic tests shall be performed as specified in Section 5.1 of ANSI/AWWA 500-93. A Affidavit of Compliance as specified in "Gate Valves General" above, shall be furnished to the MD-WASD prior to installation of the valve.

## 2.02 RESILIENT SEATED GATE VALVES

- A. Resilient-seated gate valves shall be manufactured in accordance with the applicable provisions of the most recent ANSI/AWWA Standard C509-01, "Resilient-Seated Gate Valves for Water Supply Service" asw modified herein or in conformance with the applicable provisions of ANSI/AWWA Standard C515-01 "Reduced-Wall Resilient-Seated Gate Valves for Water Supply Service" as modified herein.
- B. Valves shall have non-rising stems (NRS) and are to be installed under buried and/or submerged conditions. The design working water pressure shall be 200 psig for 3 through 12-inch sizes and 150 psig for 16 through 30-inch sizes. For valves manufactured in conformance with the provisions of AWWA C515 as modified herein, the design working water pressure shall be a minimum of 200 psig for all sizes. In addition to the pressure requirements, the valve assembly and mechanism shall be capable of withstanding an input torque of 200 ft.lbs. for valves 4-inch and smaller, and 300 ft. lbs. for valves 6-inch and larger. With the valve open the unobstructed waterway shall have a diameter not less than the full nominal diameter of the valve.
- B. Valve body: All resilient-seated gate valves manufactured in conformance with AWWA C509-94 shall be iron-bodied and shall conform to ASTM Standard A126-95, "Gray Iron Castings for Valves, Flanges, and Pipe Fittings", Class B; ASTM Standard A395-99, "Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures"; or ASTM Standard A536-84, "Ductile Iron Castings". Valve body and bonnet thickness shall conform with the requirements of AWWA Standard C509-94.

Valves manufactured in conformance with AWWA C515-01 shall be iron-bodied and shall conform to ASTM Standard A395-99, "Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures" or ASTM Standard A536-84 "Ductile Iron Castings". Body and bonnet thickness shall conform with the requirements of AWWA Standard C515-01.

All ferrous metal items in contact with the line fluids, except gray or ductile cast iron, shall be AISI Type 316 stainless steel. Valve body and bonnet gaskets shall be rubber or rubber composition, inorganic mineral fiber and paper are not acceptable. Rubber and rubber composition materials shall be suitable for use in water containing chlorine or chloramines and in sanitary sewage.

- C. Stems, stem nuts, glands and bushings shall be made of bronze as specified in ANSI/AWWA Standard C509-94 with no Grades B or C bronze being utilized. The same items for valves made

in conformance with C515-01 shall be made of the alloys specified above in the last paragraph of the "Gate Valves, General" section of this specification. The stem diameter shall conform to Table 4 of either C509 or C515 as appropriate. All valves shall be equipped with an ANSI/AWWA standard 2-inch square operating nut with skirt, or handwheel when required for above-ground service. Valve stems shall rotate counterclockwise to open. All valves 20-inch and larger shall be equipped with gearing conforming with their particular AWWA standard. Bevel or spur gearing shall be supplied as ordered with no cost differential.

- D. "O"-ring stem seals shall be neoprene, Buna-N, or approved equal. No natural rubber compounds will be acceptable. The stem seals shall be of design that permits the replacement of the "O"-ring seals while the valve is in service, without undue leakage.
- E. All external ferrous items, except gray or ductile cast iron, shall be hot dipped galvanized in accordance with ASTM Standard A123, "Zinc (Hot-galvanized) Coatings on Iron and Steel Products", or ASTM Standard A153, "Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware", or Type 304 stainless steel.
- F. Resilient seats shall be applied to the disc only and shall seat against a corrosion-resistant surface. The surface may be either metallic or nonmetallic, applied in a manner to withstand the action of line fluids and the operation of the sealing gate under long-term service. A metallic surface shall have a corrosion resistance equal to or better than bronze. A nonmetallic surface shall be in compliance with ANSI/AWWA Standard C550, "Protective Epoxy Interior Coatings for Valves and Hydrants". Resilient seats shall be bonded or mechanically attached to the gate. No natural rubber products will be acceptable. If the resilient seat is a rubber material, the method used for bonding or vulcanizing shall be proven by ASTM Standard D429, "Test Methods for Rubber Property-Adhesion to Rigid Substrates", Method A or B. For method A, the minimum strength shall not be less than 250 psi. When Method B is applicable, the peel strength shall not be less than 75 lb/in. All exposed mechanical attaching devices and hardware used to retain the resilient seat shall be of AISI Type 316 stainless steel.
- G. Flanged valves shall have ends faced and drilled conforming to ANSI Standard B16.1, Class 125. Bolt holes in the flanges shall be equally spaced and shall straddle the vertical and horizontal centerlines. Joint materials for flanged valves will be furnished with the valves.
- H. Mechanical joint valves shall have ends complying with ANSI/AWWA Standard C111/A21.11, "Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings". Mechanical joint gaskets, glands, tee-head bolts and hex nuts shall be included with the valve. Segmented glands or follower glands held in place with set screws will not be acceptable. Bolt holes in the flanges of the mechanical joint shall be equally spaced and shall straddle the vertical centerline. Gaskets shall be shipped separately in suitable protective containers. Valves for use in sewage shall have neoprene gaskets.
- I. Torque limiting device: See Section 15100, "Valves, General"
- J. Painting and coatings shall conform to the requirements of Fed. Spec. TT-C-494a on exterior ferrous surfaces, and ANSI/AWWA Standard C550 for the interior of the valve. A coating shall be applied to all ferrous parts of the valves except for finished or seating surfaces. Surfaces shall be clean and dry before painting.
- K. Testing: All production tests shall be performed on all valves supplied without exception.

Operation, shell and seat tests shall be performed as specified in Section 6.2 of AWWA C509-01 and Section 5.1.2 of AWWA C515-01 as appropriate to the standard which covers the valve in question. An Affidavit of Compliance as specified in paragraph two of the "GATE VALVES, GENERAL", section above, shall be furnished to the MD-WASD with the invoice for the valves. Final payment (prior to installation in donations situations) by the MD-WASD will not be made until after receipt of these Affidavits of Compliance.

The gate valves shall conform with the appropriate AWWA standard as modified herein and as manufactured by U.S. Pipe and Foundry Co., American Flow Control, Mueller or approved equal.

### 2.03 TAPPING VALVES

- A. Tapping valves, including the bypass valves for double-disc tapping valves 20-inch and larger, shall conform to the applicable requirements for the gate valves specified above herein, and also with the requirements listed below.
- B. With the valve open, an unobstructed waterway shall be provided, the diameter of which shall be at least the full nominal diameter of the valve, to permit taps to be made through the valve.
- C. Tapping valves shall have a mechanical joint outlet end conforming to ANSI/AWWA Standard C111/A21.11-90, "Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings" or a flanged outlet conforming to ANSI Standard B16.1 Class 125 (as called for in the particular valve order), for connection to new piping and a flanged inlet with centering ring (for all valves of 12-inch diameter and smaller and for all larger valves where the manufacturer produces a centering ring flange in that size), for connecting to the tapping sleeve. For tapping valves 12-inch and smaller, the sleeve shall be in compliance with all applicable provisions of MSS Standard Practice SP 60, latest revision, as developed and approved by the Manufacturers Standardization Society of the Valve and Fittings Industry, 127 Park Street N.E., Vienna, Virginia 22180. For tapping valves larger than 12-inch, the connecting flanged joint between the tapping sleeve and the tapping valve shall be industry standard; however, the tapping valve must provide a matching fit with tapping sleeves by other manufacturers.
- D. The tapping valves, including bypass valve when applicable, shall be furnished complete with all joint materials. Joint materials for the flanged inlets shall be ANSI-sized and approved and shall include 1/8-inch thick full faced gaskets and hot-dip galvanized carbon steel bolts and nuts with internal threads tapped or retapped after galvanizing or stainless steel bolts and nuts. The flanged inlet gaskets shall conform to the gasket material and property requirements set forth in ANSI/AWWA Standard C111/A21.11-90. All pipe connection gaskets for use in sewer applications shall be neoprene and natural rubber shall not be used in any application. Seal shall be neoprene, Buna-N, Nitrile, EPDM or approved equal, but not natural rubber. The mechanical joint outlets shall include the necessary joint materials conforming to the requirements of joint materials for mechanical joint ended gate valves of the appropriate type specified above herein (neoprene for use with sewer). Bolt holes in the flanges of the mechanical joint shall be equally spaced and shall straddle the vertical centerline. Gaskets shall be shipped separately in suitable protective containers.
- E. Valve operators for tapping valves 20-inch and larger shall be located to the right or left (when looking into the mechanical joint outlet end) as ordered by the MD-WASD.
- F. The valves shall be suitable for use with ductile-iron pipe conforming to ANSI/AWWA Standard

C151/A21.51-96, "Ductile-Iron Pipe, Centrifugally Cast, for Water", with wall thickness and outside diameter as specified in Tables 3 and 4, (Special Thickness Classes) for the following sizes:

<u>Size</u>	<u>Thickness Class</u>
4-inch	54
6-inch	53
8-inch	52
10-inch and larger	50

and with wall thicknesses and outside diameter as specified in Tables 1 and 2 (Standard dimensions and weights) of the same standard.

Pressure Class Pipe (Potable, Reuse and Raw Water Only)

<u>Size</u>	<u>Pressure Class</u>
4-inch through 12-inch	350
14-inch through 20-inch	250
24-inch	200
30-inch through 48-inch	150

- G. All production tests shall be performed on all valves supplied without exception. Operation and hydrostatic tests shall be performed as specified in Section 5.1 of ANSI/AWWA C500-93, operation, shell and seat tests shall be performed as specified in Section 6.2 of AWWA C509-94 or Section 5.1.2 of AWWA C515-01 as appropriate to the standard which covers the valve in question. An Affidavit of Compliance as specified in paragraph two of the "GATE VALVES, GENERAL", section above, shall be furnished to the MD-WASD prior to installation of the valves. Final payment (installation in donations situations) by the MD-WASD will not be made until after receipt of these Affidavits of Compliance.

The tapping valves shall conform with the appropriate AWWA valve standard as modified herein and as manufactured by U.S. Pipe and Foundry Co., American Flow Control, Mueller or approved equal.

**PART 3 - EXECUTION**

3.01 GENERAL

All valves shall be installed in accordance with provisions of Section 15100, "Valves, General." Care shall be taken that all valves are well supported.

END OF SECTION